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BRITISH MUSEUM (NATURAL HISTORY)

SPECIAL GUIDE NO. 2

BOOKS AND PORTRAITS

illustrating the

HISTORY OF PLANT CLASSIFICATION

exhibited in the

DEPARTMENT OF BOTANY

SECOND EDITION

LONDON
PRINTED BY ORDER OF THE TRUSTEES
OF THE BRITISH MUSEUM
1909
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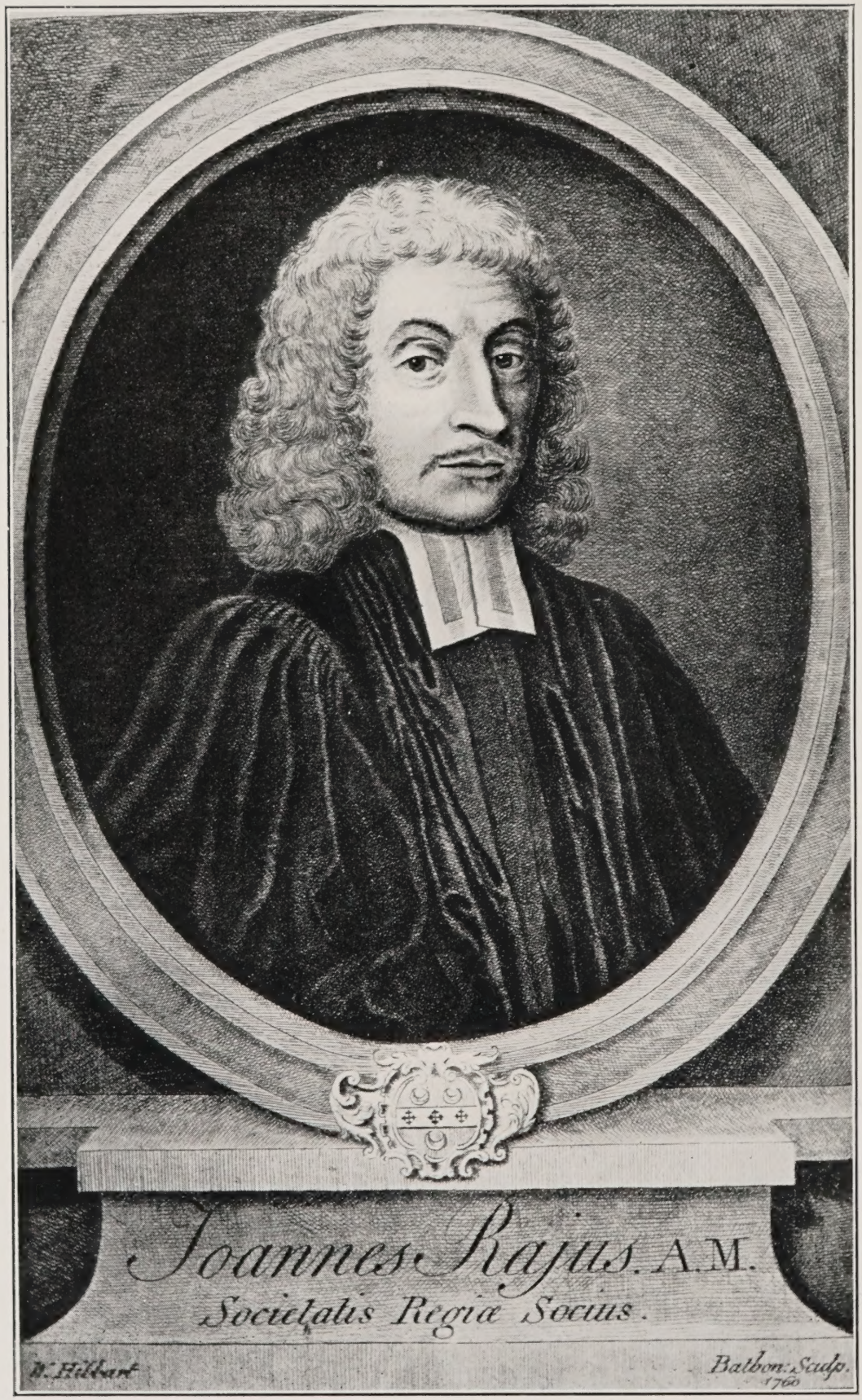
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PREFACE TO FIRST EDITION.

THIS Guide has been drawn up to accompany a collection of books and portraits which has been placed in the first recess on the left-hand side on entering the Botanical Gallery. The exhibit represents an attempt to illustrate the chief epochs in the development of a natural system of plant-classification ; that is to say a system which shows the actual relationships of plants, as contrasted with an artificial system which is based on the differences presented by one set of organs.

A. B. RENDLE.

July, 1906.

NOTE TO SECOND EDITION.

A FEW slight alterations and additions have been made in this edition.

A. B. RENDLE.

DEPARTMENT OF BOTANY,
August, 1909.

HISTORY OF PLANT CLASSIFICATION.

DIOSCORIDES [born about A.D. 40].

Materia Medica.

AN EXAMPLE of the botany of the classic period. Theophrastus, Pliny and Dioscorides knew of a considerable number of plants, to which they referred as herbs, shrubs, trees, fruits, cereals, or in similar terms indicating their general manner of growth or use to man. They had no system of classification, but gave a short general description of each plant, and an account of its medicinal use and virtues.

The volume shown is the first printed edition in the original Greek from the press of Aldus Manutius at Venice, dated 1499. The plates described are—on the left page, *Peucedanum* and *Nigella* (called *Melanthium*), on the right, *Silphium*.

There is little or nothing to record in the way of progress from the time of the classic writers to that of the botanical renaissance represented in the earlier German Herbals.

"ORTUS SANITATIS." Mainz, 1475.

A book on general natural history containing very crude descriptions and woodcuts of the plants, which frequently indicate little or no acquaintance with the object treated. No definite order is observed.

Many editions were published in various languages. The volume shown is an early Latin edition.

The fact that a work of so low a standard was generally accepted and widely used, suggests a general abeyance of the powers of observation in the study of plants and animals.

OTTO BRUNFELS.

HERBARIUM. Strassburg, 1530–36.

An early example of the Herbals of the sixteenth century, from which dates the scientific study of plants. They contain figures and descriptions from actual specimens; a botanical terminology gradually appeared; and plants which, like the Orchids, have a strong general likeness, were grouped together. The woodcuts are excellent examples of their kind.

Otto Brunfels, the son of a cooper at Castle Brunfels near Mainz, was born at that town about 1488. At first a Carthusian monk, he became a convert to Protestantism and went to Strassburg, where he opened a school; but later became a physician and removed to Berne, where he died in 1534.

WILLIAM TURNER.

HERBAL: Part 1, London, 1551; Part 2, Cologne, 1562.

Turner, who has been called the Father of English Botany, was the author of several botanical works. The arrangement of each part of his Herbal is alphabetical. The woodcuts are much inferior to those of Brunfels' Herbarium.

William Turner, a militant Protestant divine and the author of various controversial works, was born about 1512 and educated at Pembroke College, Cambridge, of which he became Fellow (1531) and Treasurer (1538). His first botanical book, *Libellus de re Herbaria novus*, was issued in 1538. His zeal for the reformed religion led to his banishment by Henry VIII., after whose death he returned and became Dean of Wells (1550). He again left England on Mary's accession, but returned in the next reign. Suspended for non-conformity in 1564, he came to London, where he died in 1568, in which year was published at Cologne a new edition of his Herbal containing a third part.

JOHN GERARD.

HERBAL OR GENERALL HISTORIE OF PLANTES. London, 1597.

The most important of the British Herbals. The page shown gives a good illustration of the method of arrangement which was evolved by the herbalists. Gerard adopted the arrangement of L'Obel, whose *Plantarum seu Stirpium Historia* was published at Antwerp in 1576. The groups recognized are based on well-marked characters of general form, manner of growth and economic use; there is a total neglect of characters of fruit and seed. The general scheme starts with what were supposed to be the simpler forms—grass-like plants with narrow leaves—and advances through the broader-leaved bulb- and rhizome-bearing Monocotyledons to dicotyledonous herbs, culminating in shrubs and trees, the latter being regarded as the most perfect.

John Gerard was born at Nantwich in 1545, and educated locally. He became a barber-surgeon in London, where he had a garden near Holborn; in 1596 he published a catalogue of the plants cultivated therein, probably the first complete published catalogue of any one garden. His Herbal was based on Dodoens' *Stirpium Historiæ Pemptades* (Antwerp, 1583); the blocks were those used by Tabernaemontanus in his *Icones* (1590), with a few original additions. Gerard died in London in 1612.

CASPAR BAUHIN.

PRODROMUS THEATRI BOTANICI. Frankfort, 1620.

A high stage of precision is reached in Caspar Bauhin's *Prodromus* and *Pinax* (1623). The general arrangement is still on the primitive lines seen in L'Obel and Gerard, but the descriptions are more scientific, and omit the medicinal detail which figured so prominently in earlier works.

Bauhin was born at Basle in 1550. He was a pupil of Leonhard Fuchs, collected plants in Italy, France and Switzerland, and became professor at Basle. He died in 1624.

ANDREA CESALPINO.

De Plantis. Florence, 1583.

Cesalpino studied the arrangement of plants from a philosophical point of view. He concluded that a natural classification must be based on the characters of fruit, seed and embryo, but still recognized the two main divisions into woody and herbaceous plants, and his method is no improvement on that adopted by the later herbalists. Cesalpino gives no general review of his system, which, however, is given by Linnæus in his *Classes Plantarum*.

The volume shown is of interest as having been the property of Marcello Malpighi (1628–1694), one of the earliest workers on plant anatomy.

Cesalpino was born at Arezzo in Tuscany in 1519, and studied under Ghini, director of the public garden at Pisa, in the university of which town he became professor of medicine and anatomy. He was afterwards chief physician to Pope Clement VIII., and died at Rome in 1603. He wrote numerous anatomical works, and to some extent anticipated Harvey's discovery of the circulation of the blood.

ROBERT MORISON.

Plantarum Historia Universalis. Oxford, 1680.

Morison's system much resembles that of Cesalpino. Woody plants are kept distinct from herbaceous ; the latter are divided into fifteen sections based partly on habit, partly on characters derived from fruit and seed. The improved arrangement and the introduction of tables renders the material more available than it was under the old arrangement of books and chapters. In Morison's works copper-plates take the place of the woodcuts of the old Herbals.

ROBERT MORISON.

PLANTARUM UMBELLIFERARUM DISTRIBUTIO NOVA.
Oxford, 1672.

The first systematic monograph of a limited group. The arrangement is based on the form of the fruit.

Robert Morison was born at Aberdeen in 1620, and studied in that University, and afterwards in Paris, taking the degree of doctor of physic at Angers in 1648. From 1650–60 he was in charge of the Duke of Orleans' garden at Blois. Returning to England at the Restoration, he was appointed King's Physician and Regius Professor of Botany, and in 1669 Keeper of the Physic Garden, Oxford, an appointment which he held until his death from an accident in a London street in 1683.

JOHN RAY.

HISTORIA PLANTARUM. London, 1686–1704.

By his recognition of the importance of the character of the embryo and the presence of one or two cotyledons, Ray inaugurated a natural system of classification. The old division into Herbs and Trees is retained.

- Herbæ
  - Imperfectæ (flowerless).
  - Perfectæ (flowering)
    - Dicotyledones.
    - Monocotyledones.
- Arbores
  - Monocotyledones.
  - Dicotyledones.

The ultimate division is into thirty-three Classes, some of which are natural groups, such as Fungi, Umbelliferæ, Stellatæ (Rubiaceæ), Verticillatæ (Labiatæ), Leguminosæ, Stamineæ (Grasses); many of these had been recognized by previous writers. In his arrangement of the Classes, Ray made use of characters afforded by the fruit and flower, as well as by other parts of the plant.

John Ray was born at Black Notley, Essex, November 29, 1627, and was educated at Braintree and Cambridge University, becoming Fellow of Trinity College in 1649, and subsequently holding various appointments at the same college. In 1660 he

issued his Catalogue of Cambridge Plants. With his friend and pupil, Francis Willughby, he made several journeys in Great Britain for the study of natural history; and, having been deprived of his fellowship in 1662 for refusal to subscribe to the new Act for Uniformity, undertook a longer tour on the continent of Europe from 1663 to 1666. In 1670 he published his Catalogue of English Plants, and in 1682 his *Methodus Plantarum Nova*, wherein he proposed the system of plant classification, which, with some improvements, he adopted in the *Historia Plantarum.* Of this great work, the first volume (here shown) appeared in 1686, the second in 1687, and the third, a supplement, in 1704.

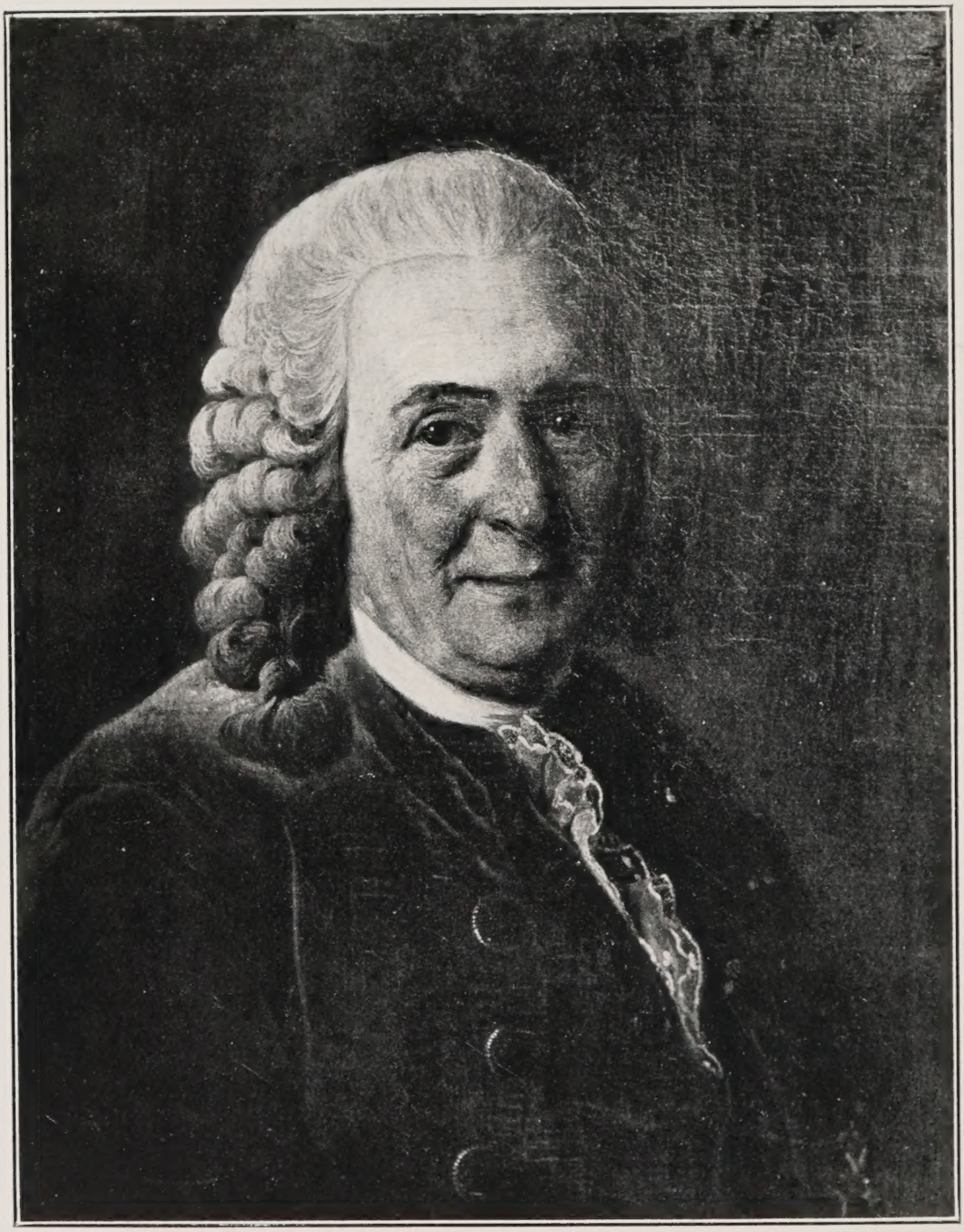
Ray published other works on natural history; among these is an account of experiments, with Francis Willughby, on ascent and descent of sap in trees. He settled at Black Notley in 1679, and died there in 1705.

JOSEPH PITTON DE TOURNEFORT.

INSTITUTIONES REI HERBARIÆ. Paris, 1700.

Tournefort's System was based on the characters of one organ, the corolla, and was therefore an artificial one, thus comparing unfavourably with that of Ray, though many of the classes are identical. The chief merit of Tournefort's work is his accurate definition of genera.

J. P. de Tournefort was born at Aix in Provence in 1656. At first a student of theology, his love of plants led him to science; he studied anatomy and medicine at Montpellier and made botanical journeys in South France and Spain. In 1683 he was appointed Professor of Botany at the Jardin des Plantes, Paris. In 1694 appeared his *Elémens de Botanique*, of which the *Institutiones* is an enlarged Latin edition. For some of his views on genera he was attacked by Ray. He was sent in 1700 on a voyage of scientific exploration to Greece and Asia Minor, and returned in 1702 with large natural history collections, including 1,356 new species of plants. The work of describing his collections, joined to his professorial and medical duties, proved too arduous; his health gave way, and he died in 1708.



CARL LINNÆUS.

From the portrait by Roslin at Stockholm.

CARL LINNÆUS.

SYSTEMA NATURÆ. Leyden, 1735.

Linnæus recognized twenty-four Classes, determined mainly by the number or some obvious character of the stamens ; the Classes are divided into Orders according to the number of the styles. Although an artificial system, based on one set of organs, its convenience led to its universal adoption ; it was known as the Sexual System.

Carl Linnæus was born at Rashult, a small village in Smaland, Sweden, May 23, 1707. His father was rector of a neighbouring parish. From his boyhood Linnæus showed a love for plants, but his literary studies made little progress. In 1727 he entered the University of Lund, for the study of medicine, but removed the next year to Upsala, where, in 1730, he was put in charge of the botanic garden as assistant to Professor Rudbeck. In 1732 he made a tour through Lapland. In 1735 he went to Holland and obtained his doctor's degree, and made the acquaintance of George Clifford, who engaged Linnæus to study and superintend the large collection in his garden at Hartecamp. The *Hortus Cliffortianus*, an account of the plants in Clifford's collection, appeared in 1737 ; the herbarium representing this book became afterwards the property of Sir Joseph Banks, and thus passed to the Department of Botany, British Museum. In Holland the *Systema Naturæ* was published (1735), and other works, including the *Genera Plantarum* (1737) and the *Classes Plantarum* (1738). Linnæus visited England in 1736. In 1738 he returned to Stockholm, and practised medicine till, in 1741, he became Professor at Upsala, where he spent the remainder of his life. In 1753 he published the *Species Plantarum*, from which dates the binominal system of nomenclature ; in this a plant is designated by two words, the name of the genus, e.g. *Rosa*, followed by a specific name, e.g. *canina*. Linnæus died in 1778. His collections are at the Linnean Society.

GEORG DIONYSIUS EHRET.

DRAWING ILLUSTRATING THE SEXUAL SYSTEM.

This famous botanical artist and friend of Linnæus published a plate illustrating the Classes of the Sexual System, of which this is the original. It was reproduced in Linnæus's *Genera Plantarum*, 1737.

CARL LINNÆUS.

PHILOSOPHIA BOTANICA. Stockholm, 1751.

Linnæus, in his *Classes Plantarum* (1738), sketched out a natural system, which appears in a revised form in the *Philosophia*. Genera are arranged in sixty-eight Orders, based not on one character but on his idea of their relationships, depending, as Linnæus expressed it, on the simple symmetry of all parts. He gives no diagnoses of the Orders, many of which had been recognized by Ray and others; some are natural groups, while others are more or less mixed.

MICHEL ADANSON.

FAMILLES DES PLANTES. Paris, 1763.

This work contains an exhaustive account of previous systems, and an arrangement of genera in fifty-eight Families, which are named and characterized.

Michel Adanson was born at Aix in Provence in 1727, and studied medicine, botany and astronomy at Paris, where he was a pupil of Reaumur. In 1748 he went to Senegal, and spent six years in studying the geography, climate and natural history of that part of west tropical Africa; the results of his observations were published in his *Histoire naturelle du Senegal*. He died in 1806, and is commemorated in the genus *Adansonia*, the Baobab.

ANTOINE LAURENT DE JUSSIEU.

GENERA PLANTARUM. Paris, 1789.

The Natural System of Linnæus was developed by the Jussieus. Bernard de Jussieu used it, with modifications, in his arrangement of the plants in the Trianon, and his nephew

THE 24 CLASSES OF THE SEXUAL SYSTEM.

From Ehret's original drawing.

Antoine further improved it. The latter defined 100 Natural Orders, and arranged them in a system of fifteen Classes under the great groups suggested by Ray—Acotyledones, Monocotyledones and Dicotyledones. The Dicotyledones were subdivided into Apetalæ, Monopetalæ, Polypetalæ and Diclines Irregulares.

A. L. de Jussieu was born at Lyons in 1748. In 1765 he went to Paris to finish his medical and scientific studies under the direction of his uncle, Bernard de Jussieu, who was in charge of the Royal Garden, and from 1770 to 1785 continued the work of rearrangement begun by his uncle. On the organization of the Museum d'Histoire Naturelle in 1793 he became Professor of Botany, and subsequently held the offices of Director and Treasurer of the administration of the Museum. He published numerous carefully elaborated memoirs on some genera and families of Dicotyledons. He died in 1836.

AUGUSTIN PYRAMUS DE CANDOLLE.

Théorie Elémentaire de la Botanique.

Ed. 2, Paris, 1819.

A. P. de Candolle showed that the relationships of plants are ascertained by the comparative study of the form and development of organs (morphology), not of their functions (physiology), and thus defined the principles of a natural system. He suggested the following arrangement :—

I. Vascular plants or plants with cotyledons.

1. Exogens or Dicotyledons.

a. With distinct calyx and corolla
- Thalamifloræ (petals free and hypogynous).
- Calycifloræ (petals perigynous or epigynous).
- Corollifloræ (petals united and hypogynous).

b. Monochlamydeæ, with a single perianth whorl (including Coniferæ).

2. Endogens or Monocotyledons.

a. Phanerogams (including Cycadeæ).

b. Cryptogams.

II. Cellular plants or plants without cotyledons.

a. Foliaceous and of known sexuality (Mosses and Liverworts).

b. Without leaves and of unknown sexuality (Lichens, Fungi, Algæ).

The general arrangement of Dicotyledons is improved, but in the inclusion of Vascular Cryptogams among Monocotyledons the arrangement is inferior to that of Jussieu.

A. P. DE CANDOLLE.

PRODROMUS SYSTEMATIS NATURALIS REGNI VEGETABILIS.

Paris, 1824–1873.

A descriptive account of all the species of Dicotyledons and Gymnosperms known when the volumes were published, and perhaps the most important factor in the development and general adoption of the Natural System. Most of the Orders were elaborated by de Candolle and his son Alphonse, who continued the work after his father's death.

Augustin Pyramus de Candolle was born at Geneva in 1778, where he spent his boyhood. From 1798 to 1808 he was in Paris, where he associated with the prominent French naturalists and published various botanical works, including a new edition of Lamarck's *Flore Française*. In 1808 he became Professor of Botany at Montpellier, where he remained till 1816. During this period he made botanical journeys in France and neighbouring countries, and wrote many botanical works, including his famous *Théorie Élémentaire*. In 1816 he visited England, whence he returned to Geneva, where he resided till his death in 1841.

ROBERT BROWN.

From the portrait by Pickersgill at the Linnean Society.

ROBERT BROWN.

PRODROMUS FLORÆ NOVÆ HOLLANDIÆ. London, 1810.

A description of Australian plants, mainly those collected by Banks and Solander in Captain Cook's first voyage round the world (1768–71) and by Brown himself (1802–5) : together with important observations on the affinities of Orders, several of which (*e.g.*, Santalaceæ, Stylidieæ) are here established for the first time.

ROBERT BROWN.

THE FEMALE FLOWER IN CYCADEÆ AND CONIFERÆ, 1827.

This paper announces the important discovery of the distinction between Angiosperms and Gymnosperms. By his investigation of difficult points in the morphology of the flower and seed, and his critical work on affinities, Brown ranks high as an exponent of the Natural System, though he published no general scheme of arrangement. The philosophical character of his work and its important bearing on many departments of Botany, led Humboldt to distinguish him as "botanicorum facile princeps."

Robert Brown was born at Montrose in 1773, and was educated at Aberdeen and Edinburgh Universities. In 1801, at the instance of Sir Joseph Banks, he went as naturalist to the expedition under Captain Flinders to Australia, and returned in 1805 with a large collection of plants, representing nearly 4,000 species. In 1810 he became librarian to Sir Joseph Banks, who (on his death in 1820) bequeathed to Brown for life the use of his library and collections. In 1827 these were transferred to the British Museum, and Brown became Keeper of the Banksian (or Botanical) Department, a post which he held till his death in 1858.

JOHN LINDLEY.

INTRODUCTION TO THE NATURAL SYSTEM OF BOTANY. London, 1830.

A slight modification of de Candolle's arrangement, with the apetalous and polypetalous Dicotyledons united in one section.

John Lindley was born in 1799 near Norwich, and was educated at the Grammar School in that town. In 1819 he became assistant librarian to Sir Joseph Banks, and was associated with the Horticultural Society from 1822 to 1858. From 1829 till 1861 he filled the Chair of Botany at University College, London. He was the author of numerous works on Botany and Horticulture, including the *Vegetable Kingdom* (1846), a general treatise, and was especially devoted to the study of Orchids. He died in 1865.

STEPHAN ENDLICHER.

GENERA PLANTARUM. Vienna, 1836–40.

Endlicher's system, which has been widely used on the Continent, shows an advance in the treatment of the Cryptogams, which are placed first and arranged in a fairly natural sequence. The chief defects are the rank assigned to Gymnosperms, and the inclusion of the Cycads and some parasitic flowering plants with the Cryptogams. The names for the three sections of Cormophyta are based on wrong ideas of growth.

Stephan Ladislaus Endlicher was born at Presburg in 1804. He had a theological education, but subsequently devoted himself to Natural History, and in 1836 became Keeper of the Herbarium in the Imperial Collections of Natural History at Vienna, where, in 1840, he succeeded Jacquin as Professor of Botany and Director of the Botanic Garden. He died in 1849.

WILHELM HOFMEISTER.

ON THE HIGHER CRYPTOGAMIA AND CONIFERÆ.
Leipzig, 1851.

The volume shown is the English revised edition published by the Ray Society, 1862.

Hofmeister's brilliant embryological researches threw much light on the relationship of the groups of Cryptogams to each other and to the Phanerogams, and indicated the position of the Gymnosperms between the higher Cryptogams and the Angiosperms. It supplies the basis for the distinction of the now generally recognized great plant groups—Thallophyta, Bryophyta, Pteridophyta, Gymnospermæ and Angiospermæ. Recent investigations of fossil plants have brought to light an intermediate group, the Pteridosperms, between Ferns and Gymnosperms, with the habit and foliage of Ferns, but bearing structures closely resembling the seeds of the higher plants.

Wilhelm Hofmeister was born in 1824 at Leipzig. Though a self-taught botanist and engaged in business, he attracted attention at an early age by his fundamental observations on the comparative embryology of the great plant-groups. In 1863 he was called to the Chair of Botany at Heidelberg, and in 1872 succeeded Hugo von Mohl at Tübingen University. He died in 1877.

HENRI BAILLON.

HISTOIRE DES PLANTES. Paris, 1867–1894.

A useful, illustrated, descriptive account of the Families of Flowering Plants, comprised in thirteen volumes.

Henri Ernest Baillon was born at Calais in 1827.

He published monographs on his Euphorbiaceæ and other families, and in 1874 became President of the newly-founded Linnean Society of Paris, remaining so until his death in 1895.

GEORGE BENTHAM & JOSEPH DALTON HOOKER.

GENERA PLANTARUM. London, 1862–1883.

The system of Bentham and Hooker, by which the herbaria here and at Kew are arranged, replaces Endlicher's book as a systematic and descriptive account of genera. It is based on that of de Candolle, and deals only with the Phanerogams.

George Bentham was born in 1800 at Stoke, near Plymouth. His early life was spent in France, where he devoted much of his leisure to botany. Returning to England in 1826, he spent a few years reading for the Bar and in arranging for the press the works of his uncle, Jeremy Bentham. From 1832 until his death in 1884, he devoted the greater part of his time to botanical work, chiefly the systematic study of genera and families, or the study of floras ; he was also the author of the important *Flora Australiensis* (1863–78). He was President of the Linnean Society from 1861 to 1874.

Sir Joseph Dalton Hooker, born in 1817, is the son of Sir William Hooker, whose name will always be associated with the development of the Royal Gardens, Kew. His life has been devoted to botany : as an explorer, in the Antarctic Regions (which he visited as botanist to Sir James Ross's expedition, 1839–43), in the Himalayas, in the Atlas Mountains, and elsewhere ; as an administrator, in connection with the Royal Gardens, Kew, where he succeeded his father as Director (1865–1885) ; and as the author of numerous and important systematic and morphological works. Reference may be made to the *Botany of the Antarctic Voyage* (1847–60), including Floras of the Antarctic Islands, New Zealand and Tasmania ; the *Handbook of the New Zealand Flora* (1867) ; the *Flora of British India* (1872–97) ; and the widely used *Student's Flora of the British Islands*, of which three editions have been issued. Sir Joseph's name is also associated with the great *Index Kewensis*, an enumeration of all the genera and species of plants from the time of Linnæus to 1885.

AUGUST WILHELM EICHLER.

SYLLABUS. Berlin, 1883.

This system has been widely used on the Continent. Eichler united the apetalous and polypetalous sub-classes of Dicotyledons, the Orders of which he attempted to arrange in a series advancing from the primitive to the most highly developed.

A. W. Eichler was born at Neukirchen in 1839, and studied mathematics and natural history at Marburg. In 1861 he went to Munich to assist Martius in the preparation of the *Flora Brasiliensis*, of which he became sole editor after Martius's death in 1868. He occupied successively the Chairs of Botany at Munich, Graz, Kiel, and Berlin. Eichler's chief original work was the well-known *Blüthendiagramme* (1875–8); he died in 1887.

ADOLF ENGLER.

SYLLABUS DER PFLANZENFAMILIEN. ed. 3, Berlin, 1903.

This represents the latest and most generally accepted view on plant classification. The arrangement of Phanerogams is based on that of Eichler, and is followed in this Gallery.

Dr. Adolf Engler, born in 1844, has been successively Custos of the Botanical Museum at Munich, Professor of Botany and Director of the Botanic Garden at the Universities of Kiel and Breslau, and, since 1889, Professor of Botany and Director of the Botanic Garden and Museum at Berlin. He is the principal editor of the most recent general work on systematic botany, *Die Naturliche Pflanzenfamilien*, and the editor of the *Pflanzenreich*, a series of monographs of the families of Flowering Plants; he is also the author of numerous papers on systematic and geographical botany.

LONDON: PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,
DUKE STREET, STAMFORD STREET, S.E., AND GREAT WINDMILL STREET, W.

GUIDE-BOOKS.

(The Guide-books can be obtained only at the Museum.)

	Postage.
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Guide to the Races of Mankind (Anthropology), 8vo. 1908. 4*d.*	1½*d.*
——— Galleries of Mammals, 8vo. 1906. 6*d.*	2½*d.*
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